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THE MAPLE SWEETENER SITUATION 1/

Maple sirup and maple sugar are made from the sap of certain species of maple trees. Virtually all of the world's supply of maple sweeteners is produced in 2 countries--the United States and Canada. The sugar in maple sap is nearly all sucrose, the same sugar extracted from sugar beets and sugar cane.

Maple sirup is made by boiling the sap (about 2 percent sucrose) in evaporators to a minimum of 65.5 percent sugar. When further concentrated and cooled to room temperature, it forms a solid cake of maple sugar. Eleven pounds (1 gallon) of maple sirup can be converted to 8 pounds of maple sugar relatively inexpensively.

There are basically 2 types of maple sirup: Table grade sirups, which are light colored and mild flavored, account for about three-fourths of total output and all that is consumed as pure maple sirup. 2/ Darker colored and strong flavored sirups are used mostly for blending with sugar sirups. The flavor of mild sirups is not sufficiently strong for blending. Conversely, the flavor of dark sirups generally is too intense to consume without blending.

Domestic Consumption

Total domestic consumption of maple sweeteners has remained relatively stable since 1948 (table 8 and fig. 5). Because total consumption held about steady while U. S. population was increasing, per capita consumption (sirup basis) declined about a fourth from 0.21 pounds in 1948 to about 0.15 pounds in 1965. However, per capita consumption in 1965 was down three-fourths from a half century ago.

Currently, an estimated two-thirds of maple sweeteners are blended with other sirups prior to consumption. The volume of cane and beet sugar sirups used in maple blends has increased to where its current use is about 3 to 5 times the annual consumption of all maple sweeteners (sirup basis). Imitation maple flavored sirups also are available.

Blended sugar and maple sirup account for about half the volume of all maple flavored sirup sales, with other maple flavored sirups accounting for most of the balance. Sales of pure maple sirup are only a small portion of the total but are relatively more important near maple sirup production areas.

Maple Sweetener Prices

Domestic retail prices of maple sirup have been sufficiently high to encourage consumers to substitute maple flavored sirups for pure maple sirup. But, maple sirup prices received by U. S. producers have not been sufficiently high to maintain production in view of increased costs and alternative opportunities, although prices have been high enough to encourage increased imports.

1/ By Frederick D. Gray, Food Consumption Section, ERS.
2/ Pure maple sirup refers to that not blended with any other products.

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Table 8.--Maple sirup and maple sugar: Supply and apparent consumption, maple sirup basis, United States, specified periods, 1916-19 to 1965 1/

Period	Domestic production				U. S. imports 2/			Apparent consumption 3/		Imports as percent of consumption
	Trees tapped	Maple sugar	Maple sirup	Total	Maple sugar	Maple sirup	Total	Total	Per capita	
	1,000 trees	1,000 pounds	1,000 pounds	1,000 pounds	1,000 pounds	1,000 pounds	1,000 pounds	1,000 pounds	Pounds	Percent
Average:										
1916-19	16,234	13,518	38,077	51,595	4,887	---	4,887	56,482	0.54	8.7
1920-24	14,880	7,042	34,069	41,111	5,373	---	5,373	46,484	.42	11.6
1925-29	13,642	3,728	32,767	36,495	8,812	214	9,026	54,547	.46	16.5
1930-34	12,284	1,883	28,802	30,685	5,478	703	6,181	36,866	.30	16.8
1935-39	11,375	1,048	29,953	31,001	7,630	1,109	8,739	39,740	.31	22.0
1940-44	9,648	605	28,283	28,888	6,676	2,953	9,626	38,517	.29	25.0
1945-49	8,352	342	16,614	16,956	7,075	3,523	10,598	27,554	.19	38.5
1950	8,090	338	22,066	22,404	8,894	5,282	14,176	36,580	.24	38.8
1951	7,301	243	19,162	19,405	8,079	3,561	11,640	31,045	.20	37.5
1952	6,802	202	17,633	17,835	11,794	5,749	17,543	35,378	.23	49.6
1953	6,335	131	13,288	13,419	12,565	4,873	17,438	30,857	.19	56.6
1954	6,391	---	18,392	18,392	9,135	4,096	13,231	31,623	.20	41.8
1955	6,138	---	17,358	17,358	8,283	5,044	13,327	30,685	.19	43.4
1956	5,666	---	16,819	16,819	9,308	7,090	16,398	33,217	.20	49.4
1957	5,346	---	18,667	18,667	6,755	8,348	15,103	33,770	.20	44.7
1958	4,612	---	15,312	15,312	8,259	7,235	15,494	30,806	.18	50.3
1959	4,517	---	12,485	12,485	10,186	7,620	17,806	30,391	.17	55.2
1960	---	---	12,364	12,364	7,895	10,009	17,904	30,368	.17	59.2
1961	---	---	16,720	16,720	8,221	9,967	18,188	34,908	.19	52.1
1962	---	---	15,906	15,906	5,128	10,252	15,380	31,286	.17	49.2
1963	---	---	12,265	12,265	6,820	11,778	18,598	30,863	.16	60.3
1964	---	---	16,863	16,863	7,413	7,439	14,852	31,715	.17	46.8
1965 4/	---	---	13,541	13,541	6,610	9,291	15,901	29,442	.15	54.0

1/ 1 gallon of maple sirup weighs 11 pounds and contains 8 pounds of maple sugar.
2/ Virtually all imports come from Canada.
3/ Production plus imports--U. S. exports are negligible.
4/ Preliminary.

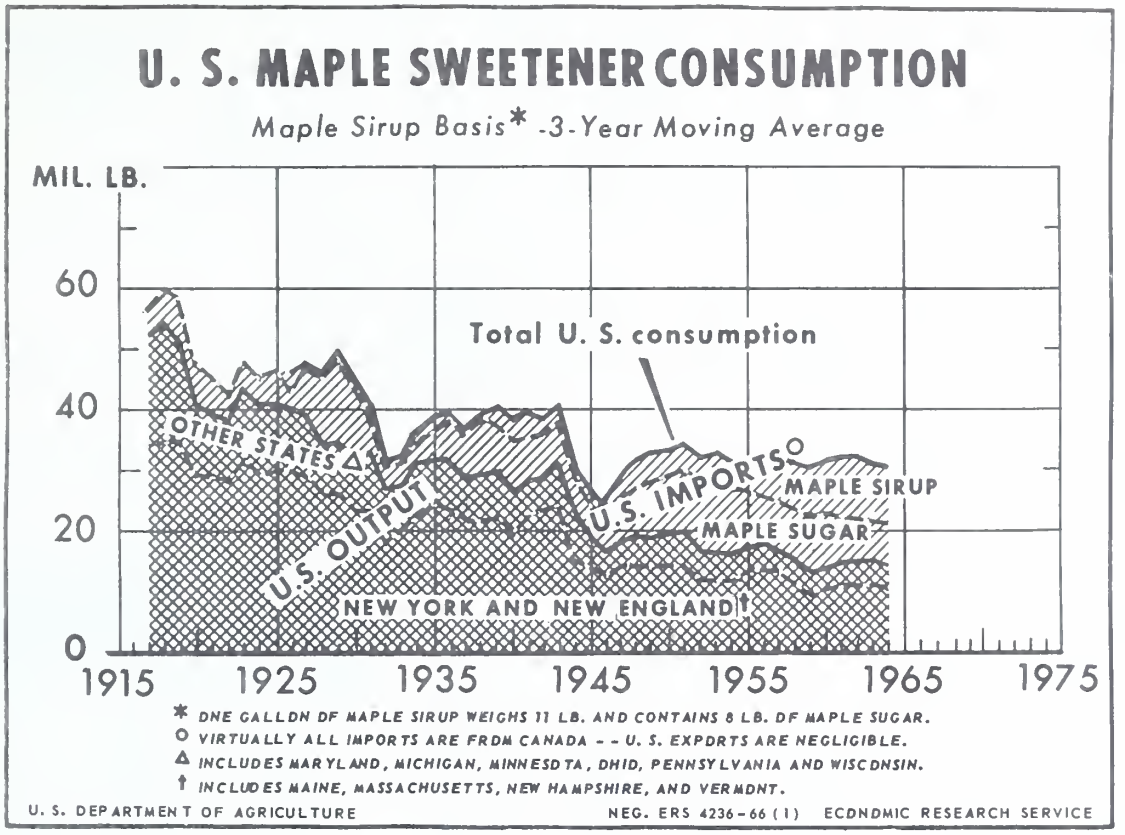

Figure 5

Since 1950, U. S. average farm prices for maple sirup have crept up irregularly to a high of 45.6 cents per pound in 1965. On a maple sugar basis, the equivalent farm price was 62.8 cents (table 9). The 1965 price was triple the 1916-19 average. Prices of imported maple products have followed roughly the same historical pattern as domestic maple sweeteners. However, they are substantially lower than comparable domestic maple sweeteners.

The large increase in output of blended sirups from 1916 to 1965 appears directly related to an increasing sugar-maple sugar price gap (table 9). In 1965, the average U. S. farm price of 1 pound of maple sirup (maple sugar basis) would purchase 6.2 pounds of refined sugar (Northeast prices). The average price of 1 pound of the imported product (maple sugar basis) would purchase about 4.5 pounds of refined sugar (Northeast prices). But back in 1916-19, the price of 1 pound of either imported or domestic maple sugar would have purchased only 2.4 to 2.5 pounds of refined sugar.

Table 9.--Maple sweetener (maple sugar basis) and refined sugar prices, United States, specified periods, 1916-19 to 1965 1/

Period	Price of U. S.-produced maple sirup 2/		Price of U. S. imports 3/			Northeast refined sugar, wholesale price 4/	Sugar/maple sweetener price ratio 5/	
	Sirup basis	Sugar basis	Maple sirup	Maple sugar	Weighted average		U. S. output	U. S. imports
	Dollars per gallon	Cents per pound	Cents per pound	Cents per pound	Cents per pound	Cents per pound	Ratio	Ratio
Average								
1916-19	1.52	19.0	6/	19.9	19.9	8.00	2.38	2.49
1920-24	2.07	25.8	6/	18.4	18.4	7.79	3.31	2.36
1925-29	2.07	25.8	6/	16.9	16.9	5.56	4.64	3.04
1930-34	1.63	20.4	13.6	18.6	18.0	4.45	4.58	4.04
1935-39	1.57	19.6	12.9	15.6	15.3	4.76	4.12	3.21
1940-44	2.35	29.4	17.9	20.9	20.0	5.24	5.61	3.82
1945-49	4.38	54.7	33.6	37.8	36.4	7.20	7.60	5.06
1950	4.16	52.0	31.9	39.6	36.7	8.00	6.50	4.59
1951	4.25	53.2	29.8	38.9	36.1	8.38	6.35	4.31
1952	4.43	55.4	29.1	38.7	35.6	8.62	6.43	4.13
1953	4.75	59.4	35.6	42.0	40.2	8.72	6.81	4.61
1954	4.63	57.9	54.7	57.7	56.8	8.72	6.64	6.51
1955	4.68	58.5	49.2	61.6	56.9	8.59	6.81	6.62
1956	4.79	59.9	35.1	54.5	46.1	8.77	6.83	5.26
1957	4.45	55.6	30.6	45.6	37.3	9.15	6.08	4.08
1958	4.51	56.4	30.7	40.6	36.0	9.27	6.08	3.88
1959	4.80	60.0	34.9	40.6	38.1	9.33	6.43	4.08
1960	4.96	62.0	38.9	42.6	40.5	9.43	6.57	4.29
1961	4.78	59.8	40.2	45.0	42.3	9.40	6.36	4.50
1962	4.68	58.5	43.6	44.1	43.8	9.60	6.09	4.56
1963	4.85	60.6	44.0	45.1	44.4	11.94	5.08	3.72
1964	5.01	62.6	43.9	46.1	45.0	10.68	5.86	4.21
1965 7/	5.02	62.8	44.4	46.7	45.4	10.17	6.18	4.46

1/ 1 gallon of maple sirup weighs about 11 pounds and contains 8 pounds of maple sugar.
2/ Average farm price.
3/ Foreign price (at point of shipment).
4/ Wholesale basing point offer price in 100-pound bags, not delivered price.
5/ The number of pounds of refined sugar (at reported market prices) equivalent to the price of 1 pound of maple sweetener (sugar basis).
6/ Imports of maple sirup were nil or negligible.
7/ Preliminary.

Domestic consumers have considerable price incentive to substitute blended sirups for pure maple sirup. One can generally purchase almost 3 times as much blended sugar sirup (85 percent) and maple sirup (15 percent), as pure maple sirup for the same retail price. Maple-honey flavored sirup 3/ and buttered sirups 4/ generally sell for a somewhat higher price than sugar and maple blends. About 4 times as much pancake and waffle sirup (with imitation maple flavor) 5/ can be purchased for the same price as pure maple sirup. For the calorie conscious user, prices of imitation maple flavor-artifically sweetened sirups 6/ usually are about a half to four-fifths the price of the same volume of pure maple sirup.

Production Trends

There has been a long-term decline in U. S. production of maple sweeteners, from 52 million pounds (sirup basis) annually during 1916-19 to about 15 million pounds during 1961-65. However, the rate of decline has slowed greatly in recent years. Domestic maple sugar output is currently negligible. Long-term trends in production in individual States have been generally similar to the overall decline in U. S. output. New York and Vermont each produce about a third of U. S. output and the remaining third is produced by 9 other States.

The decline in domestic maple sirup production is directly related to the drop from an annual average of 16.2 million trees tapped in 1916-19 to 4.5 million in 1959; there has been no apparent trend in output per tree. The number of trees currently tapped represents less than 5 percent of the trees accessibly available.

Even though U. S. output of maple sweeteners has greatly dropped since 1916-19, average output per farm has about doubled. Even so, production of maple sirup remains a part-time enterprise. Labor productivity in maple sirup production has declined relative to many other farm commodities.

Marketing Maple Products

There are currently about 7,000 domestic maple sirup producers who collect maple sap and concentrate it into sirup. About 100 processors in the United States purchase maple sirup for processing and resale. Most are relatively small and purchase less than 10,000 pounds annually, but a few purchase in excess of 60,000 pounds. Processors purchase bulk maple sirup or maple sugar either from domestic or Canadian sources. Bulk table grade sirups and all dark sirups are sold to blenders.

There are only a few blenders in the United States, but the output of the largest blender is many times that of the largest processor. The flavor of table sirup is intensified ("high-flavor") before blending with sugar sirups. Blenders distribute their product domestically in consumer containers under their own labels and also under private labels.

3/ Contains 7.5 percent maple sirup, 2.5 percent honey, 23 percent corn sirup, and 67 percent sugar sirup. 4/ Contains 2 percent butter, 2 percent maple sirup, 14 percent corn sirup, 80 percent sugar sirup, and imitation maple flavor.
5/ Contains corn and sugar sirups, imitation maple flavor, and caramel color.
6/ Contains noncaloric sweeteners.

Current Research and Innovations

Since about 1950, production of maple sirup has undergone many changes. A long-term research program aimed at producing maple trees with sap having higher sugar content has begun. New innovations both in collecting sap and making sirup have helped to reduce relative unit costs of output and to produce better quality and more sanitary products.

Maple flavor has not been completely identified, but research indicates it comes from chemical products of sugar breakdown, and soluble lignin products. A new process ("high-flavor") heats table-grade sirups in such a way that 4 to 5 times more maple flavor is developed. When 1 part of high-flavored maple sirup is mixed with 3 parts of sugar sirup, the resulting product is similar to pure maple sirup. Because dark sirups contain considerable caramel flavor, they should not be used with this process because the undesirable caramel flavor is intensified.

The establishment of central evaporators is another recent development. The producer collects sap and takes it to the central evaporator for concentration. If supplied a sufficient quantity of sap, the central evaporator processes sirup at considerably lower unit costs than smaller producers. There are currently less than 50 central evaporators in operation.

Foreign Trade

The United States produces a third of total world output of maple sweeteners, but consumes about two-thirds. Canada produces most of the remainder, largely in Quebec. Although U. S. output has declined, Canadian production of 32 million pounds is nearly the same as in the 1920's. U. S. imports from Canada increased from less than 5 million pounds (sirup basis) during 1916-19, to over 16 million pounds in recent years, from 9 percent of U. S. consumption in 1916-19 to about 55 percent during 1960-65. Imports appear to vary sufficiently to maintain relatively stable U. S. consumption. Since about 1960, U. S. imports of maple sirup from Canada have increased relative to maple sugar because of a shift in Canadian production and import demands in the United States. Since 1948, U. S. maple sirup imports have been dutiable at 1.5 cents per pound and maple sugar at 2 cents per pound.

U. S. exports were negligible during 1960-65 and consisted mostly of maple sirup in consumer containers. Because the Canadian duty currently is 17½ percent ad valorem and Canadian market prices normally are lower than U. S. prices, it appears unlikely that U. S. exports to Canada will increase in future years.

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